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(71) Applicant

Pall Corporation

(Incorporated in the USA – New York)

2200 Northern Boulevard, East Hills, New York,
New York 11548, United States of America

(72) Inventor

James T Connors Jr

(74) Agent and/or Address for Service

Mathisen Macara & Co

The Coach House, 6–8 Swakeleys Road, Ickenham,
Uxbridge, Middlesex, UB10 8BZ, United Kingdom

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(54) Filter for an aggressive fluid

(57) A filter for an aggressive fluid such as a hot sulphuric acid or solvent-based printing ink includes two housing sections (10, 30) made of a material resistant to the aggressive fluid. The housing sections are combined to define a chamber enclosing a filter element 61, and a seal member 62 forms a fluid-tight seal between the housing sections and clamps the filter element in place round its periphery. A plastic overmold 50, made of a material which need not be resistant to the aggressive fluid, secures the housing sections together with seal member 62 under pressure. Interlocking formations on the housing sections prevent relative rotation.

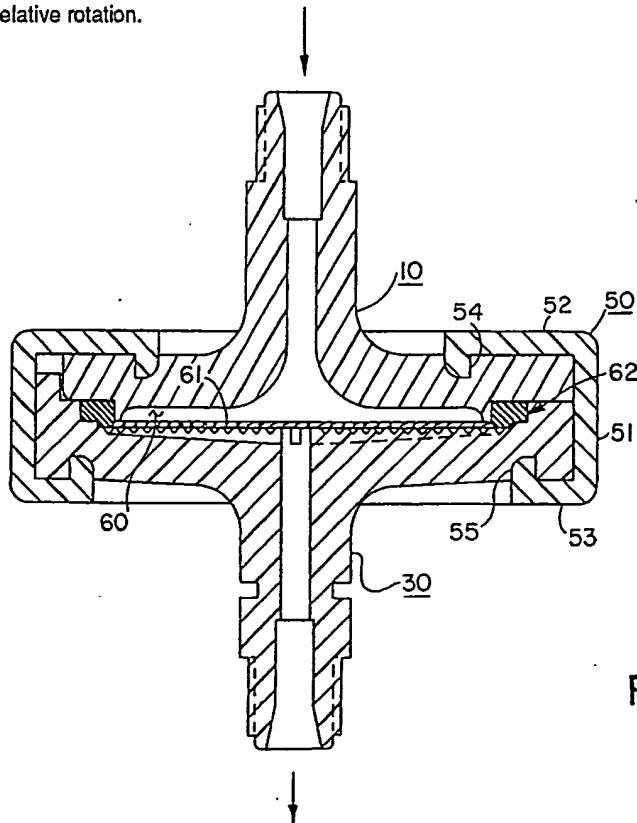


FIG. 1

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CLAIMS

1. A filter for filtering an aggressive fluid comprising:

5 a housing including an inlet, an outlet, and first and second housing sections combined to form a chamber communicating with the inlet and the outlet;

a filter element for filtering the aggressive fluid disposed inside the chamber;

10 a seal member forming a fluid-tight seal between the housing sections; and

an overmold formed around the first and second housing sections and isolated from the chamber by the seal member.

15 2. A filter as claimed in claim 1 wherein the housing sections comprise a first plastic material and the overmolding comprises a second, different plastic material not resistant to the aggressive fluid.

20 3. A filter as claimed in claim 1 or 2 wherein the housing sections comprise polyphenylene sulfide.

4. A filter as claimed in claim 1 or 2 wherein the housing sections comprise at least one of polyphenylene sulfide, PTFE, PFA, FEP, PVDF, and PEEK.

25 5. A filter as claimed in any preceding claim further comprising rotation preventing means for preventing relative rotation of the housing sections.

6. A filter as claimed in claim 5 wherein the

rotation preventing means comprises a projection formed on the first housing section and a recess formed in the second housing section for receiving the projection.

5 7. A filter as claimed in any preceding claim wherein the overmold includes an engaging portion which engages with a corresponding engaging portion in the housing.

10 8. A filter as claimed in claim 7 wherein the engaging portion in the housing comprises a recess formed in an outer surface of one of the housing sections, and the engaging portion in the overmold comprises a flange mating with the recess.

15 9. A filter as claimed in any preceding claim further comprising drainage and support means formed in one of the housing sections to allow drainage of filtrate to the outlet.

20 10. A filter as claimed in claim 9 wherein the drainage and support means comprises a plurality of drainage grooves formed in a surface of one of the housing sections surrounding the outlet and a drainage channel extending outward from the outlet and intersecting the drainage grooves.

25 11. A filter as claimed in claim 10 wherein the cross-sectional area of the drainage channel increases towards the outlet.

 12. A filter as claimed in any preceding claim wherein the seal member comprises an elastomeric O-ring having a cross-sectional center disposed

outside the periphery of the filter element when the O-ring is in an uncompressed state.

13. A filter as claimed in any preceding claim wherein the housing includes means for restraining
5 the filter element from movement.

14. A filter as claimed in claim 13 wherein the means for restraining the filter element comprises the seal member.

15. A filter comprising:
10 a housing including an inlet, an outlet, and first and second housing sections combined to form a chamber communicating with the inlet and the outlet;
a filter element having a periphery and disposed inside the chamber; and
15 an elastomeric seal member in sealing contact with the first and second housing sections to prevent fluid from leaking from the housing and in sealing contact with the filter element to prevent fluid from bypassing the filter element.

20 16. A filter as claimed in claim 15 wherein the elastomeric seal is compressed between the first and second housing sections and the periphery of the filter element.

25 17. A filter as claimed in claim 15 or 16 wherein the center of the cross section of the seal member is disposed outside the periphery of the filter element when the seal member is in a non-compressed state.

30 18. A method of manufacturing a filter

comprising:

disposing a filter element in a chamber defined by a first housing section and a second housing section;

5 disposing an elastomeric seal between the housing sections along a periphery of the filter element; and

forming an overmold around the housing sections while urging the housing sections towards one another to compress the seal member into a compressed state and create sealing contact between the seal member and the housing sections.

19. A method as claimed in claim 18 wherein the overmold is formed such that the strength of the overmold in a cooled state is sufficient both to maintain the seal member in a compressed state and to maintain the first and second housing sections clamped together during normal operation.

20. A method of manufacturing a filter comprising:

disposing a filter element and an elastomeric seal in a chamber defined by a first housing section and second housing section with the elastomeric seal disposed along a periphery of the filter element and contacting a surface of the first housing section; and

urging the housing sections towards one another to press the elastomeric seal into sealing contact with the surface of the first housing section, with a surface of the second housing section, and with a surface of the filter element.

21. A filter for filter an aggressive fluid

substantially as herein described with reference to
and as illustrated in the accompanying drawings.

22. A method of manufacturing a filter
substantially as herein described.

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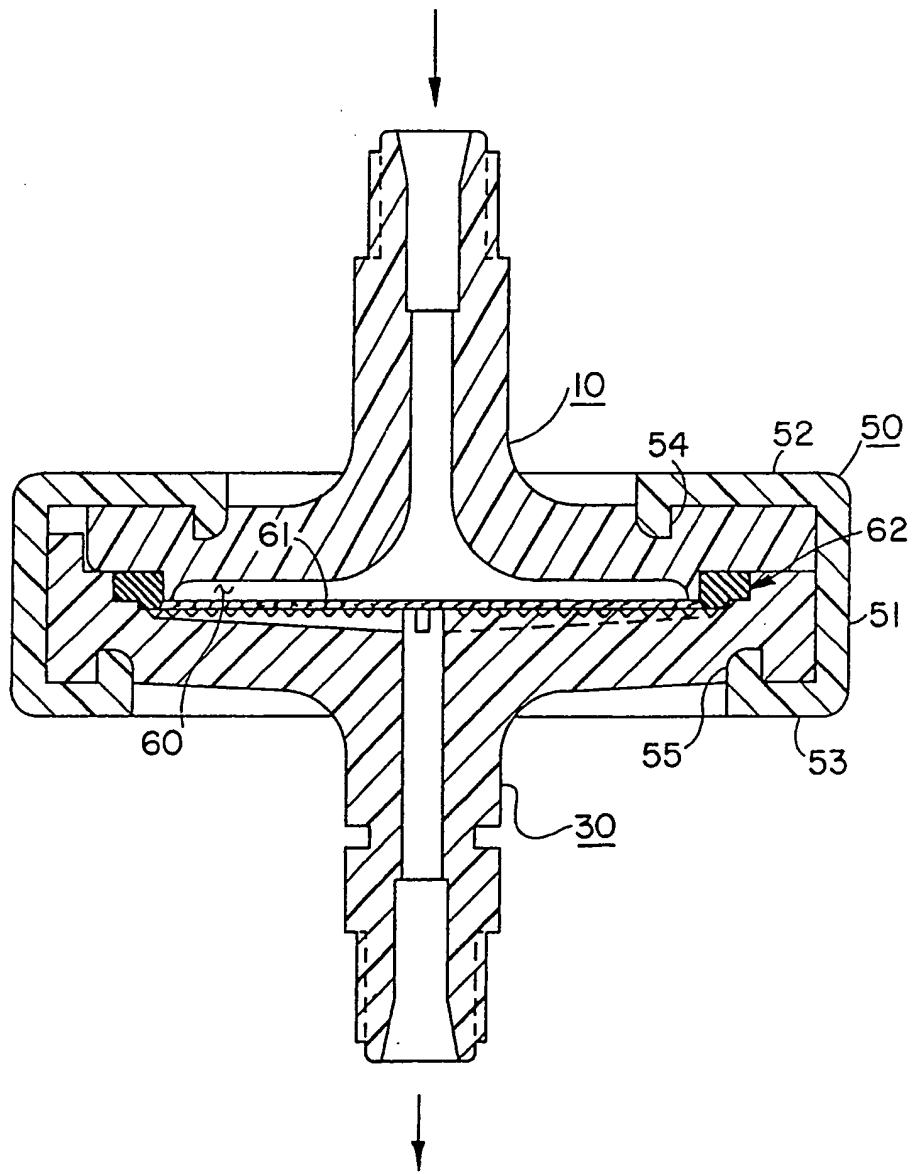


FIG. 1

FIG. 2

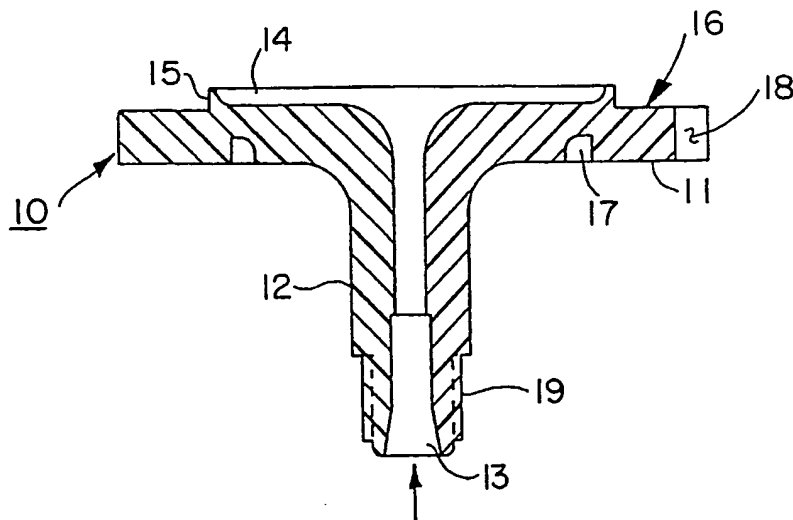
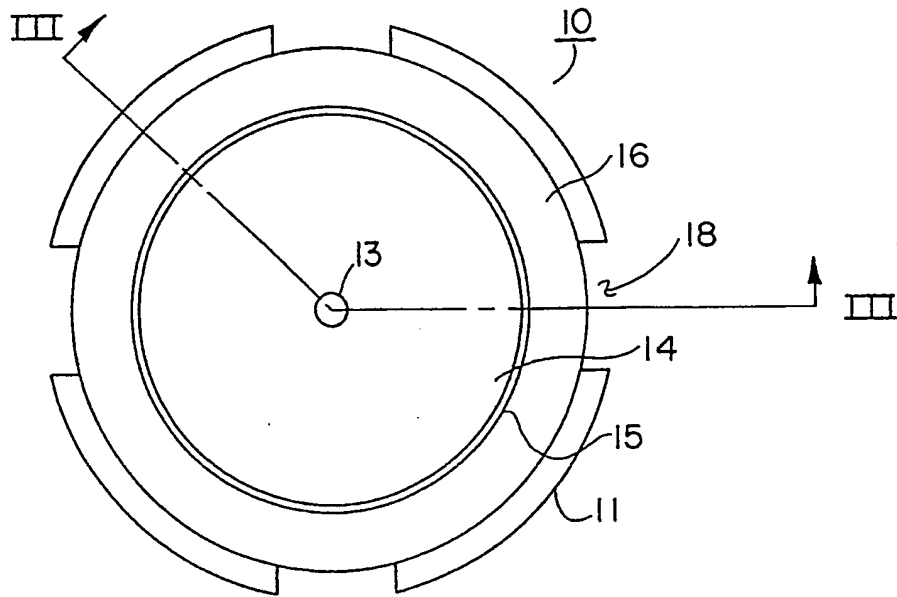


FIG. 3

FIG. 4

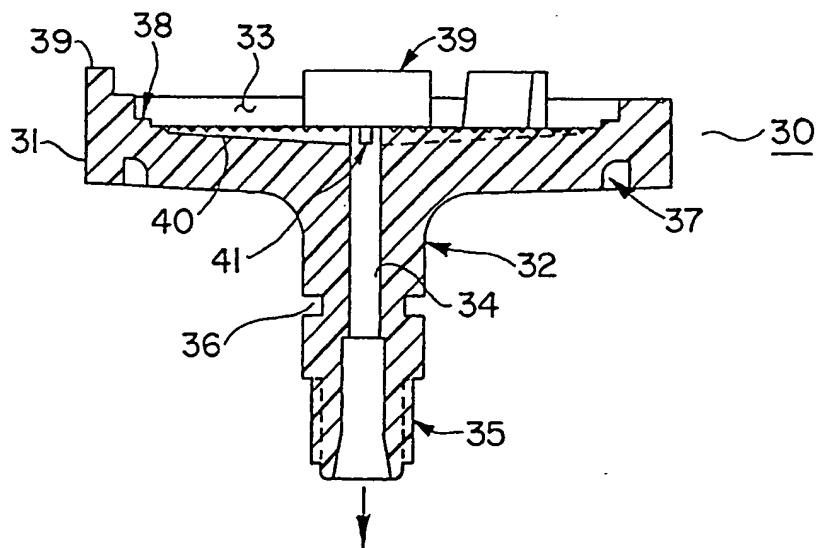
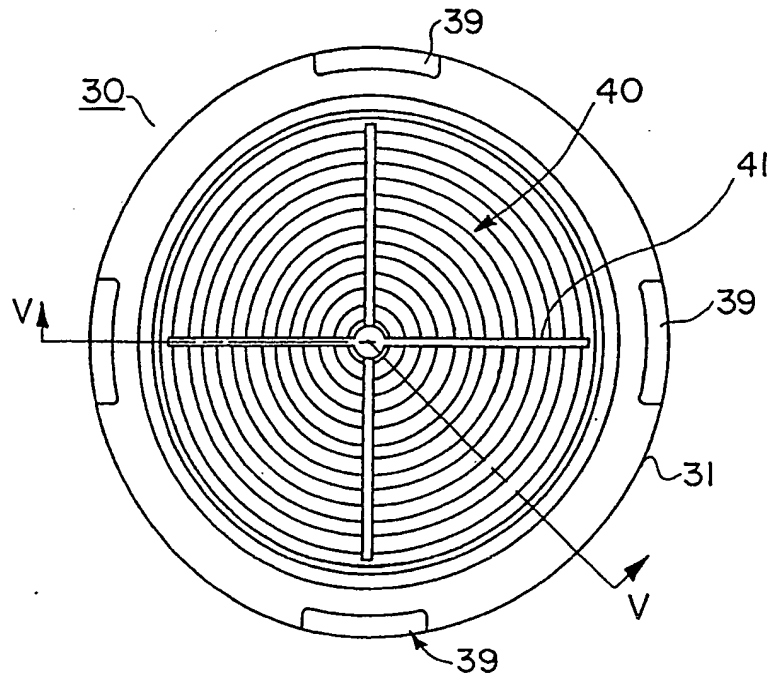


FIG. 5

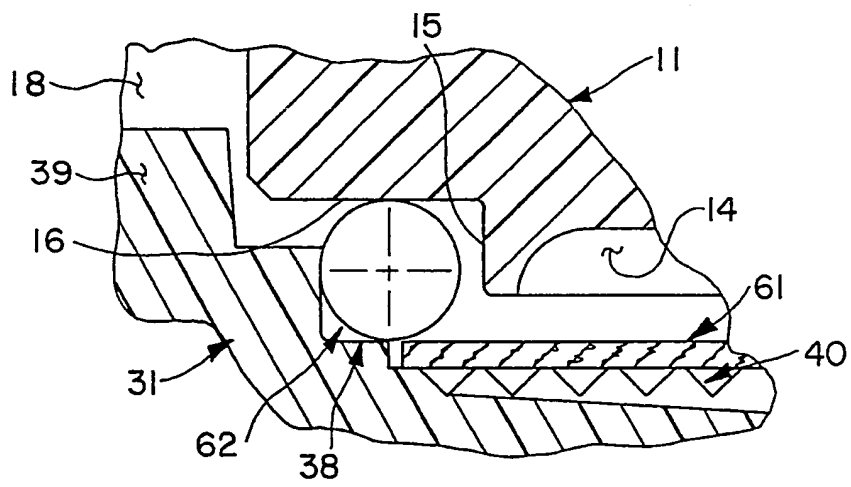


FIG. 6